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The part played by an "accessory factor" in the production of experimental rickets.

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In these experiments puppies of about two months old were fed on diets which were found to produce rickets in the course of 3–4 months. Two such diets were used:

(1) Milk, rice, oatmeal and sodium chloride,
(2) Milk and bread.

Salt is essential for life in the case of the first diet. The milk must be limited to less than 200 c.c. each day. If it is much increased no rickets develop.

In the case of other puppies, different classes of foodstuffs were added to the ricketty diet and the development or non-development of the disease investigated. The results were of such a nature that if rickets did not develop it could be assumed that it contained some anti-rachitic factor.

The following lists briefly indicate some of the results obtained:

Substances preventing rickets	Substances not preventing rickets
(1) Meat.	(1) Protein of meat.
(2) Watery extract of meat free from protein.	(2) Casein.
(3) Malt extract.	(3) Linseed oil.
(4) Commercial yeast extract.	(4) 10 grams of yeast a day.
(5) 500 c.c. of milk each day.	
(6) Butter.	
(7) Margarines.	
(8) Cod liver oil.	

An examination of these tables shows that fats, proteins and carbohydrates are not causative factors. On the other hand it seems clear that rickets is a deficiency disease of the type of scurvy and beri-beri. Similarly the anti-rachitic accessory factor has characters related to the growth accessory factor, although it is not identical with the latter, since rickets is rather an abnormality of growth and is most prominently shown in quickly growing animals.

Exercise may be an additional factor in the development of rickets but is not primary. Several dogs were kept on a mixed diet containing meat and confined without exercise for some months. They did not develop rickets. On the other hand puppies on a ricket's diet, however much freedom they are allowed, become lethargic in their movements some time before the legs bend. There is a physical flabbiness about them that one associates with rachitic children. When the condition is really developed no real exercise is possible owing to the physical disabilities.

To sum up:

(1) Rickets is a condition primarily due to the lack of an accessory factor in the diet.

(2) This accessory factor is found in (i) Extractives especially meat, (ii) Fats especially butter but not in linseed oil.

(3) Lack of exercise may play some part but not a primary part in the development.